UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/350,492	07/09/1999	VENKATESH KRISHNAN	10981455-1	8205

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EXAMINER
TANG, KENNETH

ART UNIT	PAPER NUMBER
2127	

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/350,492	KRISHNAN ET AL.
	Examiner	Art Unit
	Kenneth Tang	2127

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *30-52* is/are pending in the application.

　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *30-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　a)☐ All　b)☐ Some * c)☐ None of:

　　1.☐ Certified copies of the priority documents have been received.

　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
　　application from the International Bureau (PCT Rule 17.2(a)).

　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   In view of the Appelent's Brief filed on 7/19/04, PROSECUTION IS HEREBY

REOPENED. New grounds of rejections are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following

two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37

CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a

supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or

other evidence are permitted. See 37 CFR 1.193(b)(2).

2.   Claims 30-52 are presented for examination.

Claim Objections

3.   Claim 42 is objected to because of the following informalities: "strictures" (line 3)

should be changed to "structures". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4.   Claims 30-52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention:

a.   In claim 30, "the theads interface layer" (line 7) is indefinite because it is not

made explicitly clear whether this refers to the threads interface layer (line 3), or to

specifically, the native threads interface layer (line 7).

b.   Claim 47 is rejected for the same indefinite reasons as stated in the rejection of

claim 30.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 30-35 and 47-52 are rejected under 35 U.S.C. 102(e) as being anticipated by

Nelson (US 2001/0049686).

6.   As to claims 30 and 47, Nelson teaches a system for adapting threads support in a virtual

machine to an underlying platform of the virtual machine *(page 1, [0006], page 3, [0039])*,

comprising:

-       threads interface layer (Java-to-JDMK layer, Fig. 6) that provides a standard threads

        interface for a set of threads associated with an application program of the virtual

        machine (Java Virtual Machine) such that the standard threads interface does not depend

on the underlying platform (platform-independent) *(page 3, [0039], page 1, [0006], Fig. 6, items 608, 610, and 114)*;

- native threads interface layer (Java Native Interface Layer, Fig, 6) for adapting the threads interface layer to the underlying platform (communicates by appropriate JAVA or JDMK message protocol adaptors) such that a set of routines in the threads interface layer use a set of routines (library of C and/or C++ methods) in the native threads interface layer to support the threads (Solaris threads) *(pages 2- 4, [0032]-[0033] and [0039], Fig. 6, items 608, 610, and 614)*

7.   As to claim 31, Nelson teaches the system of claim 30, wherein the native threads interface layer is adapted to an operating system of the underlying platform (*Java Native Interface ("JNI") Layer 604 includes a library of C and/or C++ methods configured to define a Java Virtual Machine ("JVM") that provides translation of CMIS to Java.", "this layer also includes Solaris threads configured to provide additional support when the MPA is running in conjunction with the Solaris operating system", [0039]*).

8.   As to claim 32, Nelson teaches the system of claim 31, wherein the native threads interface layer is adapted to use a set of thread support routines provided by the operating system (*Java-Native-Interface-("JNI")-Layer-604-includes-a-library-of-C-and/or-C++-methods configured to define a Java Virtual Machine ("JVM") that provides translation of CMIS to Java.", "this layer also includes Solaris threads configured to provide additional support when the MPA is running in conjunction with the Solaris operating system", [0039]*)..

9.   As to claim 33, Nelson teaches the system of claim 31, wherein the native threads

interface layer is adapted to use a set of routines provided by the operating system that perform

equivalent functions of functions in the native threads interface layer (*Java Native Interface

("JNI") Layer 604 includes a library of C and/or C++ methods configured to define a Java

Virtual Machine ("JVM") that provides translation of CMIS to Java. ", "this layer also includes

Solaris threads configured to provide additional support when the MPA is running in

conjunction with the Solaris operating system", [0039]*).

10.   As to claim 34, Nelson teaches the system of claim 30, wherein the native threads

interface layer is adapted to a hardware architecture of the underlying platform (*Java Native

Interface ("JNI") Layer 604 includes a library of C and/or C++ methods configured to define a

Java Virtual Machine ("JVM") that provides translation of CMIS to Java. ", "this layer also

includes Solaris threads configured to provide additional support when the MPA is running in

conjunction with the Solaris operating system", [0039]*).

11.   As to claim 35, Nelson teaches the system of claim 30, wherein the standard threads

interface is a Java threads class (*Java Native Interface ("JNI") Layer 604 includes a library of C

and/or C++ methods configured to define a Java Virtual Machine ("JVM") that provides

translation of CMIS to Java. ", "this layer also includes Solaris threads configured to provide

additional support when the MPA is running in conjunction with the Solaris operating system",

[0039]*).

12.   As to claim 48, it is rejected for the same reasons as stated in the rejection of claim 31.

13.   As to claim 49, it is rejected for the same reasons as stated in the rejection of claim 32.

14.   As to claim 50, it is rejected for the same reasons as stated in the rejection of claim 33.

15.   As to claim 51, it is rejected for the same reasons as stated in the rejection of claim 34.

16.   As to claim 52, it is rejected for the same reasons as stated in the rejection of claim 35.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17.   **Claims 36 and 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over**

Nelson (US 2001/0049686) in view of Delagi et al. (hereinafter Delagi) (US 3,858,182).

18.   As to claim 36, Nelson fails to explicitly teach the system of claim 30, wherein the

routines in the threads interface layer maintain a set of context information for each thread in

terms of the virtual machine. However, Delagi teaches saving context information from a

previous virtual machine to a current virtual machine *(context information, virtual machine,*

restore previous context, col 8 lines 6-18). It would have been obvious to one of ordinary skill in

the art at the time the invention was made to combine the teachings of Nelson and Delagi

because the Delagi feature of maintaining context information in terms of the virtual machine

would increase efficiency and reduce overhead of Nelson's system when resuming execution of

any program is needed *(col 8, lines 6-15)*.

19.   As to claim 38-42, it is rejected for the same reasons as stated in the rejection of claim 36.

In addition, it is well known in the art of the concept and advantages of providing the "native

threads support routines include a routine for resuming, waiting for completion, yielding

execution, stopping execution and cleaning up of a particular thread". It would have been

obvious to one of ordinary skill in the art at the time the invention was made to have included

these basic and standard functions/routines to the existing system for the reason of improving the

control of thread/task management scheduling.

20.   **Claims 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson (US**

2001/0049686) in view of Bucher (US 5,421,014).

21.   As to claim 37, Nelson teaches wherein the native threads interface layer is adapted to an

operating system of the underlying platform (*Java Native Interface ("JNI") Layer 604 includes a*

library of C and/or C++ methods configured to define a Java Virtual Machine ("JVM") that

provides translation of CMIS to Java.", "this layer also includes Solaris threads configured to

provide additional support when the MPA is running in conjunction with the Solaris operating

system", [0039]) but fails to explicitly teach having a set of context information for each thread.

However, Bucher shows that it is common knowledge in the art of context switching that the

multi-threading and context switching for threads that context information for multiple are used

to uniquely identify threads and the information (context information) that is necessary to relate

to each of the threads *("Multi-threading is accomplished by temporarily suspending execution of*

one thread and beginning execution of another, eventually restoring the suspended thread to

complete its execution. In order to perform multi-threaded operations, the computer is required

to internally store context information for multiple threads, update context information at

appropriate times during execution of the thread, and uniquely identify threads and the context

information related to each of the threads.", col. 1, lines 59-68). It would have been obvious to

one of ordinary skill in the art at the time the invention was made to combine the teaching of

Nelson and Bucher because Bucher's feature of having context information for each thread

would improve context switching and multi-threading by having the necessary information

which uniquely identifies the particular thread *(col. 1, lines 59-68)*.

22.   **Claims 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson**

(US 2001/0049686) in view of Farrell et al. (hereinafter Farrell) (US 5,630,128).

23.   As to claims 43-46, Nelson teaches having native threads support routines but fails to

explicitly teach a routine for setting a priority, obtaining a priority, obtaining an identifier, and

finally executing of a particular thread. However, Farrell discloses threads being set a priority.

The priority is also being obtained and classified. The threads are being identified and selected

before they are finally executed *(col. 2, lines 24-45)*. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to combine the teaching of Nelson

and Farrell because Farrell's executing of a thread based on priority would increase the control

of the scheduling of the program with priority scheduling. In addition, a multitasking operation

system permits application programs to influence a schedule of execution of program threads

(see Abstract).

Response to Arguments

*24.   Applicant argues on A that Nelson and Poole do not disclose or suggest a virtual
machine having a two tier arrangement for threads support as claimed in claims 30 and 47.*

In response, the Examiner respectfully disagrees. Nelson teaches a two tier arrangement

for threads support with the first tier being the Java-to-JDMK layer and the second tier being the

native threads interface layer *(Fig. 6, 608, 610)*. These two layers have JAVA or JDMK

Message Protocol Adaptors (MPAs) for communicating and adapting between these two layers

(tiers) *(page 3, [0033] and [0039], Fig. 6, 114)*.

25.   *Applicant argues on B that Nelson and Poole do not disclose or suggest a virtual machine having a threads interface layer that provides a standard threads interface for a set of threads associated with an application program executed by the virtual machine such that the standard threads interface does not depend on an underlying platform of the virtual machine because Nelson specifically discloses Solaris threads.*

In response, the Examiner respectfully disagrees. Applicant is point to the wrong layer.

In the claims, it is the Threads Interface Layer (not the Native Threads Interface Layer) that is

stated to be platform independent. The Solaris threads that the Applicant is referring to are not

associated with the Java-to-JDMK layer (Native Threads Interface Layer) but rather with the

Java Native Interface Layer. In other words, the Threads Interface Layer is platform

independent. The Java to JDMK layer is the Threads Interface Layer and it <u>does not</u> use the

Solaris threads. Nelson does teach platform independence *(page 1, [0004], lines 20-22, and*

[0006], lines 1-5).

26.   *Applicant argues on B that a Java Virtual Machine executes the platform-independent Java application programs. In contrast, the threads interface layer of claims 30 and 47 is part of a virtual machine.*

In response, the Examiner respectfully disagrees. The virtual machine system as claimed

inherently has an operating software system that provides for the execution of processes and

threads to its layers. Nelson also teaches the Java Virtual Machine that also has with that also

supports that. The Java Virtual Machine could not operate without an operating system that

interfaces with the virtual machine.

27.   *Applicant argues on C that Nelson and Poole do not disclose or suggest a virtual machine having a native threads interface layer that adapts a threads interface layer in the virtual machine to an underlying platform of the virtual machine.*

In response, the Examiner respectfully disagrees. The adapting between the two layers

occur using Message Protocol Adaptors (MPAs) *(page 3, [0033] and [0039])* and these MPAs

are used to communicate between the two layers by the appropriate JAVA or JDMK interfaces

(page 3, [0039], Fig. 6, 114).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Kenneth Tang whose telephone number is (571) 272-3772. The

examiner can normally be reached on 8:30AM - 6:00PM, Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kt
10/13/04

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